

Health Priority Design Approaches in Library Buildings: The Case of Çukurova University

Çiğsem Yağmur YÜKSEL^{1*} , Mustafa YEĞİN² 

ORCID 1: 0000-0002-6775-8348

ORCID 2: 0000-0002-0025-6589

¹ Çukurova Üniversitesi, Mimarlık Fakültesi, Mimarlık Bölümü, 01380, Adana, Türkiye.

² Çukurova Üniversitesi, Mimarlık Fakültesi, Mimarlık Bölümü, 01380, Adana, Türkiye.

*e-mail: cyyuksel@cu.edu.tr

Abstract

The declaration of a pandemic on March 11, 2020 significantly affects the space organization process, which includes health-priority design approaches such as controlled communication, social distance, and reduction of physical contact. In this study, it is aimed to reorganize the library buildings with health priority design approaches in order to organize and re-function the used areas during the pandemic process. Çukurova University Central Library building was chosen as a case study. The working areas and current situation plans of the library building were evaluated through systematic observation, taking the Covid-19 preventive measures as criteria. Consequently, it was determined that health priority design criteria in library buildings should be advanced heating, cooling and ventilation systems, window sizes and shading elements that control sunlight and air flow, placement of green plants that keep indoor relative humidity above 40%, spatial organization decisions that reduces user capacity and interaction between them. Moreover, the approaches that take into account the health of the society and the researcher and the design decisions that include the rules, suggestions and principles published by individual designers and academics as a result of feeling responsible for the subject were proposed.

Keywords: Library buildings, space organization, health priority design, pandemic architecture, Covid-19

Kütüphane Binalarında Sağlık Öncelikli Tasarım Yaklaşımları: Çukurova Üniversitesi Örneği

Öz

11 Mart 2020'de pandemi ilan edilmesi, kontrollü iletişim, sosyal mesafe, fiziksel temasın azaltılması gibi sağlık öncelikli tasarım yaklaşımlarını içeren mekan organizasyon sürecini önemli ölçüde etkilemektedir. Bu çalışmada kütüphane binalarının sağlık öncelikli tasarım yaklaşımları ile yeniden düzenlenmesi için kullanılan alanların pandemi sürecinde düzenlenmesi ve yeniden işlevlendirilmesi amaçlanmaktadır. Çukurova Üniversitesi Merkez Kütüphane binası örnek olay olarak seçilmiştir. Kütüphane binasının çalışma alanları ve mevcut durum planları, Covid-19 önleyici tedbirler kriter alınarak sistematik gözlem yoluyla değerlendirilmiştir. Sonuç olarak, kütüphane binalarında sağlık öncelikli tasarım kriterlerinin, gelişmiş ısıtma, soğutma ve havalandırma sistemlerinin kullanılması, güneş ışığını ve hava akışını kontrol eden pencere boyutları ve gölgeleme elemanları, iç ortam bağıl nemini %40'ın üzerinde tutan yeşil bitkilerin yerleştirilmesi, kullanıcı kapasitesini ve aralarındaki etkileşimi azaltan mekansal organizasyon kararları olması gerektiği belirlenmiştir. Ayrıca, toplumun ve araştırmacının sağlığını dikkate alan yaklaşımlar ve bireysel tasarımcılar ile akademisyenlerin konuya karşı kendilerini sorumlu hissetmeleri sonucunda yayınladıkları kural, öneri ve ilkeleri içeren tasarım kararları önerilmiştir.

Anahtar Kelimeler: Kütüphane binaları, mekan organizasyonu, sağlık öncelikli tasarım, pandemi mimarisi, Covid-19

Citation: Yüksel, Ç. Y. & YeğİN, M. (2022). Health priority design approaches in library buildings: The case of Çukurova University. *Journal of Architectural Sciences and Applications*, 7 (2), 586-597.

DOI: <https://doi.org/10.30785/mbud.1116900>



1. Introduction

Universities are places that have different functions in order to generate scientific production, train qualified manpower, and thus contribute to social development. The most important support units of university education are university libraries, which are based on the information production process of universities and where the principle of "accumulated progresses of knowledge and science" is kept alive (Tamdoğan, 2009). Especially academic libraries, due to their commitment to the theme of access to information and information resources, are an important gathering place for students and academic staff in universities. The aim of this article is to reduce the risk of Covid-19 infection with space organization solutions in academic library buildings and to create a guide that determines the 'health-priority' architectural design decisions in library design. As a case area, the Central Library of Çukurova University, which was declared one of the Research Universities in Turkey on December 13 2021 (Council of Higher Education [CoHE], 2021), was chosen. The findings of the research show that the evaluation of library structures according to health-priority design conditions, the prevention of Covid-19 infection and spread, the functional, aesthetic, reliable, thermal, verbal and auditory comfort and social space design creates inclusive approaches. In addition, flexible design approaches and functional building performance in emergency situations were analyzed to prevent the Covid-19 pandemic and other similar epidemics. In accordance with the social distance requirement of at least 1.00 m in the workspaces determined by the World Health Organization (WHO, 2020), workspaces were rearranged without any formal changes. As a result, the proposed layout and other findings are presented to guide the 'health priority' design criteria under the pandemic architecture.

2. Material and Method

This article presents the case study as a type of quantitative research that makes inquiries and offers suggestions on the possibilities of integrating library buildings into the 'new normal' in the context of organizational and spatial solutions in the Covid 19 pandemic period or any disaster situation. In addition, according to the report titled "University Libraries in Turkey Towards 2023" published by CoHE in 2014, it was recommended to prepare a guide that explains the differentiated applications according to existing buildings and new projects in order to carry out university library building.

The significance of the case study is basically stated in that it is the first university library guide that determines the 'health priority' architectural design decisions in the library design prepared for the pandemic environment and the precautions to be taken in case of disaster. It provides a systematic approach to evaluate the functional performance and efficiency of the existing academic library. During this study, it was tried to combine data obtained through literature review, observation and on-site detection studies according to the Covid-19 preventive criteria determined by the World Health Organization. This contextualization which is an effective approach regarding the reuse of the space organization of the library during / after Covid-19 was provided with the techniques of taking photographs, taking surveys and observing the areas of verbal communication and interaction.

As a result, It is clearly seen that scientific research methodology for library performance efficiency on Table 1.

Table 1. Research methodology for library performance efficiency

Research methodology based on scientific work
<p>1. Determining the purpose of the study: How does the organizational structure of the library change in the case of a disaster such as Covid-19? How can it be harmonized with health conditions within the interior layout and physical environmental conditions? How does the pandemic affect the user needs in the psychosocial dimension? Are the material preferences used in the interior health priority for pandemic conditions?</p>
<p>2.The methods used: -'Observation by taking the Covid-19 preventive measures as a criterion' is the most practical method used in the answers sought for research problems. -behavioral maps (to observe and record behaviors) -taking surveys and library sensor data calculating the number of people passing through the safety barrier</p>
<p>3. Case study: Çukurova University Central Library building</p>
<p>4.Analysis of the collected data: Evaluation of the data obtained through literature review, observation and on-site detection studies according to the Covid-19 preventive criteria determined by the World Health Organization.</p>
<p>5. The conclusions drawn: -healthy priority approaches in the issue of plan transformation -redesign in an emergency, -flexible design of workspace and interior layout decisions</p>

2.1. Case Study

In this research, the Central Library of Çukurova University which was declared one of the Candidate Research Universities in Turkey (CoHE, 2021) was selected as a case study. The library is centrally located on the Çukurova University campus (Fig.1). The five-storey building has reading halls with a seating capacity of eight hundred people at the same time, an exhibition, a conference hall, a reading room for the disabled, a computer hall, twenty thousand books and a collection of over one hundred (Table 2-6). Moreover, twenty-nine people have a place in the administrative staff class.

As part of its academic mission, the Central Library supports the university's educational, research-development activities and community service-advisory activities. Although the library has a regional limit of twelve thousand m² in the central campus location, it serves only eight thousand m² due to the blocks allocated to the University's three institutes and the Informatics Department. However, it could be said that the service will become more efficient if the Institutes and Informatics Departments are moved to their own buildings (Table 5).



Figure 1. Çukurova University (CU) Central Library entrance (on left) and Layout plan (on right) (Source: Author)

Table 2. The Central Library Ground Floor Plan (Scale: 1.1000)

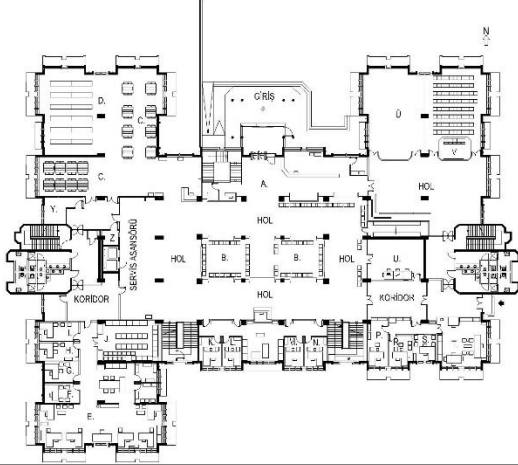
	Space Capacity (Σm^2)	
	A. 31,34 m ²	L. 11,06 m ²
	B. 76,89 m ²	M. 11,15 m ²
	C. 129,48 m ²	N. 12 m ²
	D. 91,45 m ²	P. 16,31 m ²
	E. 94,72 m ²	R. 13,55 m ²
	F. 11,26 m ²	S. 10,64 m ²
	G. 10,87 m ²	T. 42,79 m ²
	H. 12,66 m ²	U. 49,12 m ²
	I. 12,88 m ²	Ü. 89,69 m ²
	İ. 20,4 m ²	V. 89,38 m ²
	J. 40,84 m ²	Z. 4,89 m ²
	K. 12,47 m ²	
	CU Central Library Ground Floor Plan – Units Location	
A. Entrance Hall B. Waiting Room C. Workspace D. Open Book R. E. Catalog And Classification		
F. Staff R. G. Staff R. H. Academic Per. R. I. Staff R. I. Warehouse		
J. Open Book R. K. Branch Manager R. L. Staff R. M. Computer And Telecomination Speed.		
N. Staff R. P. Branch Manager R. R. Academic Staff R. S. Secretariat T. Head Of Department R.		
U. Disabled Work R. U. Empty Area V. Meeting Room L. Rest R. Z. Masjid		

Table 3. CU The Central Library First Floor Plan (Scale: 1.1000)

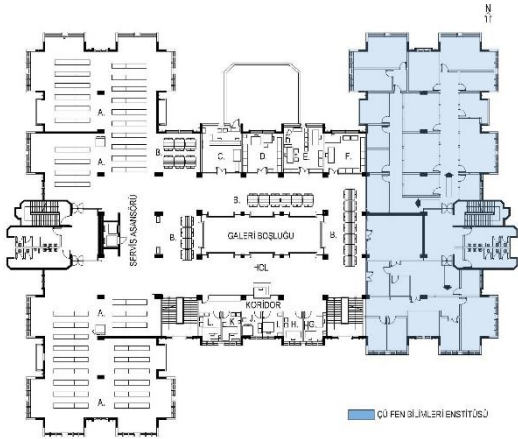
	Space Capacity (Σm^2)	
	A. 581,04 m ²	
	B. 320,22 m ²	
	C. 31,48 m ²	
	D. 26,86 m ²	
	E. 31,19 m ²	
	F. 29,96 m ²	
	G. 12,32 m ²	
	H. 11,35 m ²	
	I. 9,42 m ²	
	J. 8,88 m ²	
	K. 11,45 m ²	
	L. 12,8 m ²	
	CU Central Library First Floor Plan- Units Location	
A. Open Book R. B. Study A. C. Lending D. Ancient Works E. WRSCH (Kadaum) F. Multimedia		
G. Staff R. H. Staff R. I. Staff R. J. Staff R. K. Staff R. L. Staff R.		

Table 4. CU The Central Library Second Floor Plan (Scale: 1.1000)

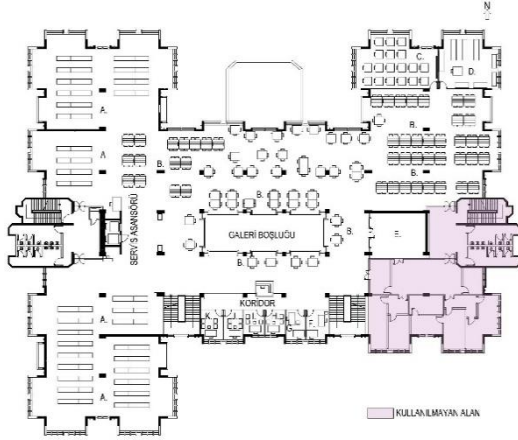
	Space Capacity (Σm^2)		
	A. 567,17 m ²		
	B. 611,85 m ²		
	C. 66,56 m ²		
	D. 51,61 m ²		
	E. 44,99 m ²		
	F. 12,32 m ²		
	G. 11,35 m ²		
	H. 9,42 m ²		
	I. 8,88 m ²		
	J. 11,45 m ²		
	K. 12,8 m ²		
	CU Central Library Second Floor Plan - Units Location		
	A. Open Book R. B. Study Area C. Computer Study R. D. Eu Documentation R. E. Warehouse		
F. Staff R. G. Staff R. H. Staff R. I. Staff R. J. Staff R. K. Staff R.			

Table 5. CU The Central Library Third Floor Plan (Scale: 1.1000)

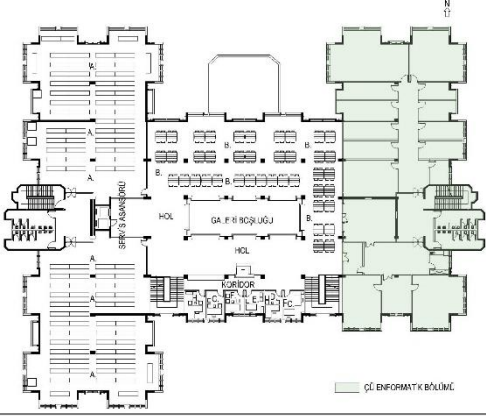

	Space Capacity (Σm^2)
	A. 671,76 m ²
	B. 333,37 m ²
	C. 12,32 m ²
	D. 11,35 m ²
	E. 9,42 m ²
	F. 8,88 m ²
	G. 11,45 m ²
	H. 12,8 m ²
CU Central library Third Floor Plan - Units Location	
A. Open Book R. B. Study Area C. Staff R. D. Staff R. E. Staff R.	
F. Staff R. G. Staff R. H. Academic Staff R.	

Table 6. CU The Central Library Basement Floor Plan (Scale: 1.1000)

	Space Capacity (Σm^2)
	A. 275,1 m ²
	B. 32,51 m ²
	C. 52,99 m ²
	D. 496,82 m ²
	E. 9,95 m ²
	F. 8,13 m ²
	G. 11,77 m ²
	H. 10,6 m ²
	I. 10,48 m ²
	J. 9,05 m ²
Cu Central Library Basement Floor Plan - Units Location	
A. Free Workspace B. Photocopy C. Air Handling Unit D. Boiler Room E. Wc	
F. Wc G. Warehouse H. Warehouse I. Warehouse J. Warehouse	

3. Findings and Evaluations

On April 16, 2020, the World Health Organization published interim guidance on adjusting public health and social distancing conditions to assess and manage the risk of re-occurrence. In this guide, many countries around the world have developed a series of additional measures that guide the prevention of Covid-19 transmission in different contexts and reduce the risk of its spread. There are proposals to develop policies and operating procedures that are sensitive to health and safety issues for public employees, especially in public workplaces and closed workplaces. It is in the building group that is exposed to the risk of Covid-19 infection at a high level due to the closed study areas, meeting rooms and computer laboratories that lead to close contact and interaction in the library buildings.

In addition, in the built environment of the library building,

- Spatial solutions that support close interaction between individuals (free work spaces, meeting rooms, etc.)
- The presence of materials and objects likely to carry infectious diseases,
- The adequacy of the ventilation systems in terms of technical features,

- The virus suspended in the air through action diversity, has a high potential for indoor spread in terms of transmission by transfer.

The building requirement program is formed according to the user capacity of the building, the frequency and duration of use of the spaces. Calculating the risk of spreading the virus, it is important to observe the points where the most social interaction, direct contact between individuals and road axes are intense. Therefore, the behavior and frequency of indoor users in the ground floor plan of Çukurova University Central Library were observed between 13.00 pm - 15.00 pm on randomly selected days in October 2019. Color codes are used to distinguish between the walking orientations of external users and internal users (Fig.2). Students and academics are shown in cold colors as external users, technical and administrative personnel and managers are shown in warm colors.

At the center of the library building, different actions such as waiting, walking, sitting, working and speaking are in flux surrounding the gallery space. According to the individual actions on the behavior map, the density of people and the frequency of movement around the waiting area on the ground floor plan and towards the stairs are higher (Fig. 2).

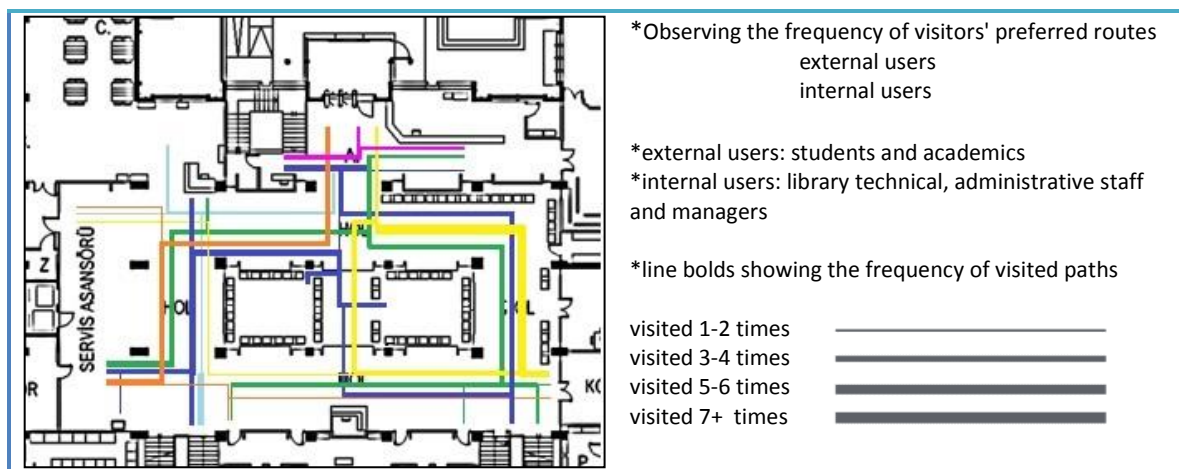


Figure 2. Behavioral mapping on the ground floor schematic plan

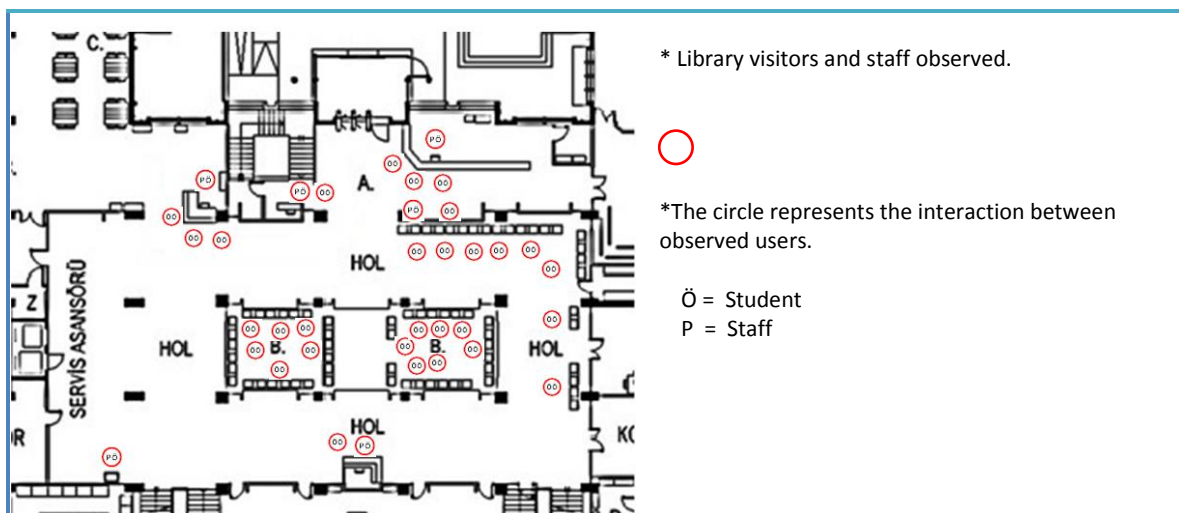


Figure 3. Observation points with verbal communication and interaction

In addition, research is conducted on the hypothesis that 'spatial organization suitable for free movement in library structures will reduce confidentiality and privacy'. This hypothesis was tested using verbal communication and interaction between students and staff (Fig. 3). When a simple observation is made, it is seen that there are quite large differences in the connection properties of the lines to other lines. It is these differences that govern the effect of space in movement within the system. Less deep space will attract more movement and the deeper space will attract less movement (Hillier, 2001). Therefore, when individuals move within integrated spaces, they will interact directly or indirectly with the surrounding surfaces and with each other. For this reason, the information desks

and the location of the waiting area in the library can be defined as the places where student-student and student-staff interaction is most intense.

The efficiency of library performance depends on its appropriate design in accordance with the spatial organization and environmental conditions. For this reason, the building programming phase should be handled within a certain model (Şener, 1979; Öz, 1992). When considering this model, scientific data such as grouping the spaces according to their function, purpose of use, capacity, user behavior and environmental relationships should be organized in a systematic way. In this study, the academy library buildings were evaluated based on the Covid-19 criteria of the World Health Organization in three general aspects. These are physical environmental conditions, psycho-social dimensions and indoor equipment layout plans in order to reduce the risk of Covid-19 infection and provide users with the need for spatial comfort.

3.1. Physical Environmental Conditions

Physical environmental conditions affect the risk of virus transmission and survival in the built environment in the context of Covid-19,

- The length of air circulation, ventilation sources and distribution channels,
- Changes in humidity and temperature levels indoors,
- Light (daylight and artificial lighting) (Dietz et al., 2020).

First, adjusting the air exchange rates inside the building provides dilution of the inhaled air by the filtration of viral particles. Implementing advanced heating, cooling and ventilation (HVAC) systems operational practices such as highly efficient penetrating filters, ventilation and filtration will help to reduce the potential spread of Covid-19. Moreover, window dimensions and where they are designed in the plan layout have importance. The frequency of opening windows and the designing of a sufficient number of them on each facade to provide passive ventilation will transmit the air coming from outside directly through the building envelope easily.

Secondly, maintaining indoor relative humidity >40% will significantly reduce the infectivity of aerosolized viruses (Noti et al., 2013). The library managers and building technical personnel will become evident to be responsible for the regular maintenance of the HVAC systems, the control of the filters, the presence of instruments that measure the indoor humidity level and the regular control of these mechanisms to reduce the infectivity.

Finally, a healthy library environment provides natural protection against respiratory diseases. Working under sunlight conditions reduces interactions with viruses (Bangwal et al., 2022). In addition, a level of illumination is required to prevent disturbances such as glare, thermal and radial loss, especially in working areas. Therefore, window sizes and shading element design on the building envelope are important for the controlled transmission of daylight into the space. For example, it was observed that the shading efficiency decreased as the height value increased by accepting the window width as constant, and the shadow coefficient value decreased in the summer and winter months. The width of the window and the height of the fixed outer shade element do not affect the shading efficiency (Yüksel, 2018). The precautions to be taken in the building envelope and the design of the work areas will help reduce the transmission of viruses and microorganisms during and after Covid-19.

3.2. Psychosocial dimension

In the context of pandemic architecture, the needs in terms of psycho-social dimensions were examined under three headings: health priority, behavioral and aesthetic.

3.2.1. Health priority needs

According to the WHO (2020), the measures to prevent the risk of Covid19 transmission are as follows in library structures exposed to high risk:

a) hand hygiene:

Before and after contact with equipment and people in the area, hands should be washed with soap and water regularly or with alcohol-based wipes. Verbal communication is intense indoors (Fig. 3); hand disinfectants should be placed at accessible points around the meeting room, working areas, circulation points (stairs and elevators) and information desks.

b) Respiratory hygiene:

Attention should be paid to the use of medical face masks and respiratory ethics (coughing, sneezing, etc.).

c) Physical distance:

At least 1 m distance should be maintained between people in entrance areas, elevators, stairs, and especially in meeting areas, common work areas (Fig. 4), where human density and movement are fluid. In the working areas, the layout should be planned according to the density of people, so that there cannot be more than 1 person in every 10 m². In the library building, surprise working hours should be determined at the start and exit times of the administrative and technical personnel, and crowding and crowding of employees should be prevented at these times.

d) Regular environmental cleaning and disinfection:

First, it is necessary to identify areas of high contact for disinfection. These areas in the library structure are commonly used areas such as door and window handles, wet areas (toilets and taps), touch screen devices, work surfaces. However, routine spraying of disinfectants on indoor environmental surfaces is generally not recommended. Because direct spraying is ineffective at removing contaminants outside of their target areas. This may cause eye, respiratory and skin irritation and other toxic effects. In addition, the World Health Organization does not recommend placing designs that spray disinfectants directly on people, such as tunnels, cabins, and rooms, inside or around the building. In summary, what building managers should do is use disinfection to inactivate (i.e. kill) pathogens and other microorganisms on surfaces after cleaning and cleaning using soap or a neutral detergent, water and mechanical treatment (scrubbing, scrubbing).

e) Risk education, information and communication:

Management's regular sharing of information on Covid-19 risk using official sources such as government agencies and WHO, and the adoption of protective measures are important in the context of the need to combat rumors and misinformation. Posters, videos and electronic message boards should be placed at the points intense verbal interaction (Fig. 3), to increase awareness of Covid-19 among students and to encourage individual practices. In addition, it is necessary to provide feedback from internal and external users and include them on these boards.

f) Management of probable / confirmed Covid-19 cases:

To manage a person with a probable /confirmed case of Covid-19 in the library, it is necessary to place the person in an isolation room, limit the number of contacts, use personal protective equipment, and follow up on regular cleaning and disinfection. For this reason, in the event of any epidemic and disaster in the library structure, the isolation room should be included in the needs program. In addition, converting idle or storage spaces into isolation rooms according to the current building program should be added to the emergency plan. This room should be located on the ground floor and close to the exit to make the spatial organization and functional performance efficient.

3.2.2. Behavioral needs

'Psychological comfort', which is defined as the user's identification, ownership and feeling under the control of the personal area in which they interact with their environment, according to their workspace experiences, is one of the three components that organize environmental comfort (Vischer, 2008). According to studies, it has been found that people who move from private indoor environments to open workspaces judge their environment more negatively due to lack of privacy, acoustic conditions (noise), and privacy issues (Brennan, Chugh, & Kline, 2002; Rishi, Sinha, & Dubey, 2000). In addition, in the context of Covid-19 measures, prolonged exposure to work under the

condition of physical and psychological distance will have a negative impact on employees. All these factors will cause increased stress levels and anxiety in employees (Center for the Study of Traumatic Stress, 2020). For this reason, in order to increase the motivation and comfort of internal and external users, work areas should be designed in accordance with flexible design principles with partition heights that are integrated with nature and protect the feeling of privacy in the library structure.

3.2.3. Aesthetic needs

The phenomenon of aesthetics in the library environment is related to how beautiful, comfortable and motivating the users perceive the space, the harmony of the original working and learning environment with the texture of the campus, and other qualifying adjectives that are experienced and interpreted by the user. The harmony and balance of multiple design parameters such as material, form, structure and color affect the user's perception. In designs with health priority, the importance of designing a relaxing and healing environment that gives a feeling of light and spaciousness and is integrated with nature is revealed.

3.3. Indoor equipment layout plan

Library structures are among the building types that contain a high risk of Covid-19 transmission. In this study, a pandemic architecture proposal is presented that presents health priority design decisions and necessary actions in an emergency. In the library structure, which has a high user potential, its spatial configuration and equipment layout are re-planned. In the CU Central Library, a linear circulation is suggested instead of a central one, which reduces human interaction and verbal communication. In addition, it is suggested that the waiting area, located in the center on the ground floor, be transformed into a flexible waiting area with dividers or a flexible isolation space when necessary. Without changing the formal features, the user capacity in the workspaces of pandemic architecture has been reduced, and the equipment (work tables, chairs, kiosks, etc.) has been planned to be placed at a distance of 1.5 m (Fig. 4). Therefore, there is a need for storage space for the increasing reinforcement elements and equipment in the library.

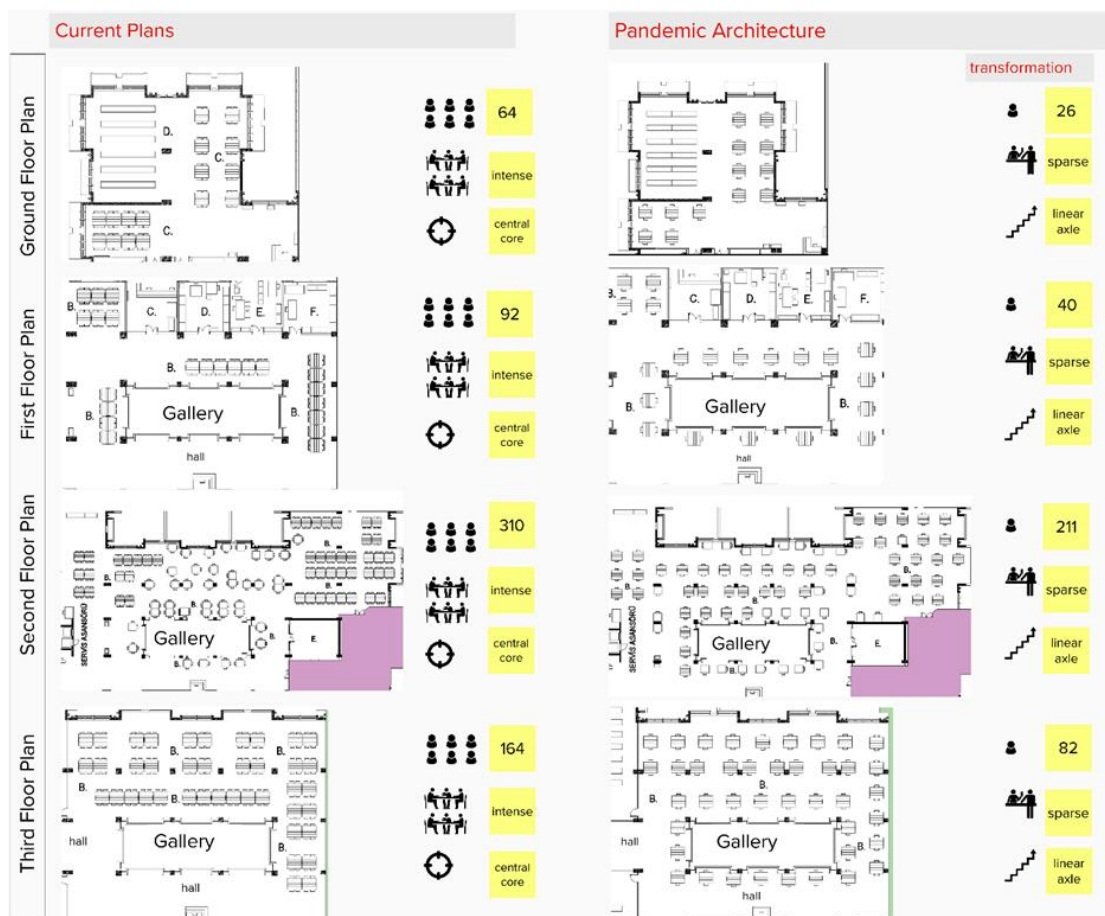


Figure 4. CU The Central Library Building Schematic transformation



Figure 5. An example of the suggested transparent plexiglas spacer (Choice Media Channel, 2020)

In addition to this, equipment that makes the employee feel safe during interaction with the user and in any contact situation is also required. The protective equipment shown in Figure 5 and made of plexiglass, for example, is a 1.5 ft (2.4 m) high barrier (Choice Media Channel, 2020) (Fig. 5). Transparent plexiglass partitions that act as a protective safety barrier could be placed on the communication points of the staff and users at the information desks. Secondly, in the context of creating a pandemic culture, it is very important that information boards and guidance signs are reminders and create a behavioral model.

The life span of the Covid-19 virus varies between 3 hours and 72 hours, depending on the type of material it comes into contact with (Doremalen et al., 2020). However, the research from Australian agency CSIRO found the virus was "extremely robust," surviving for 28 days on smooth surfaces such as glass found on mobile phone screens and both plastic and paper banknotes, when kept at 20C (68F), which is about room temperature, and in the dark (Riddell et al., 2020). For this reason, the outer surfaces of the reinforcement material types should be analyzed in terms of quality in the library building.

Materials covered with wood, metal, glass, plastic, stainless steel, fabric or leather are used on the outer surfaces of various reinforcement elements used in the interior of the Central Library building. In library structures, the frequency of touching and using items such as desks, chairs, information desks, door handles, elevator buttons, kiosks and touch surfaces of electronic devices, libraries, seating units. On these surfaces where contact risks are high, cleaners containing 62-71% ethanol can be used due to their efficiency in killing the virus (Kampf et al., 2020). Effective routine surface cleaning protocols should also be implemented by building managers.

4. Result and Suggestions

This study is a research that evaluates the design of the university library in the pandemic environment and the precautions to be taken in case of any disaster within the framework of health priority design.

As a result of the case study, it is seen that:

- Spatial organization suitable for free movement in library structures reduces privacy and confidentiality, and increases social interaction.
- There is a high density of people and a high frequency of movement in waiting areas, in front of information desks, and on the roads leading to circulation points.
- The size of the warehouse space in a newly designed library building should be designed by taking into account the need for the pandemic period.
- Unused spaces in the building should be converted into warehouses in order to preserve the surplus equipment.
- In the event of any disaster or pandemic, an isolation room for first aid and social distance protection for the sick should be included in the academy library structure needs program.
- In the event of a disaster in the library, the dimensions of the shelter should be sufficient to serve a sufficient number of users.

Health priority library design decisions for pandemic architecture are as follows:

- using advanced heating, cooling and ventilation systems,
- window sizes and shading elements controlling the sun shine and air flow,
- placing the green plants that keep the indoor relative humidity above 40%,
- Spatial organization reducing the user capacity and interaction between them

It is thought that this study will form a basis for the following studies:

- Research reflecting the meaning of the changing conditions with Covid-19, new trends in pandemic architecture, and different understandings of the future of the library,
- Researches that prioritize the health priority design criteria and offer a new perspective in the design of the Academy Library, Spatial organization research in the emergency plans of multifunctional and public building groups.

Acknowledgment and Information Note

Authors would like to thank Çukurova University and library staff for their support to the research. This study includes the preliminary results of a research initiated within the scope of the graduate course named 'Building Evaluation'.

Ethics committee approval is not required for this study.

Author Contribution and Conflict of Interest Declaration Information

The authors declare that for this article they have no actual, potential or perceived conflict of interests.

References

- Bangwal, D., Suyal J. & Kumar, R. (2022). Hotel building design, occupants' health and performance in response to COVID 19. *International Journal of Hospitality Management*, Volume 103, <https://doi.org/10.1016/j.ijhm.2022.103212>.
- Brennan, A., Chugh, J.S. & Kline, T. (2002). Traditional versus open office design: A longitudinal study. *Environment and Behavior*, 34(3), 279-299.
- Center for the Study of Traumatic Stress. (2020). Prolonged Operations in Personal Protective Equipment During Covid-19: Recommendations for Workers and Managers. <https://www.cstsonline.org/> Retrieved on: 10.08.2020
- Choice Media Channel. (2020). The Socially Distanced Library Physical Spaces, Transition Tactics, and a Look at the Data (video) <https://www.youtube.com/watch?v=p8bAVfCkbSQ&list=WL&index=2&t=47s> Retrieved on: 06.08.2020
- Council of Higher Education [CoHE]. (2021). <https://www.yok.gov.tr/Sayfalar/Universiteler/arastirma-universiteleri.aspx> Retrieved on 13.12.2021
- Dietz, L., Horve, P.F., Coil, D.A., Fretz, M., Eisen, J.A. & Van Den Wymelenberg, K. (2020). 2019 novel coronavirus (Covid-19) pandemic: built environment considerations to reduce transmission. *mSystems*,5(3), <https://doi.org/10.1128/mSystems.00245-20>.
- World Health Organization [WHO]. (2020). Considerations for public health and social measures in the workplace in the context of Covid-19. <https://www.who.int/publications/i/item/considerations-in-adjusting-public-health-and-social-measures-in-the-context-of-covid-19-interim-guidance> Retrieved on 09.12.2020
- Hillier, B. (2001). A Theory Of The City as Object or How Spatial Laws Mediate the Social Constructions of Urban Space, 3rd International Symposium on Space Syntax, Brazil, 02:1-9.
- Kampf, G., Todt, D., Pfaender, S. & Steinmann, E. (2020). Persistence of Coronaviruses on inanimate surfaces and its inactivation with biocidal agents. *The Journal of Hospital Infection*, 104:246–251. <https://doi.org/10.1016/j.jhin.2020.01.022>.

- Noti, J.D., Blachere, F.M., McMillen, C.M., Lindsley, W.G., Kashon, M.L., Slaughter, D.R. & Donald, H.B. (2013). High humidity leads to loss of infectious influenza virus from simulated coughs. *PLoS ONE*, 8(2): e57485. <https://doi.org/10.1371/journal.pone.0057485>
- Öz, Z. (1992). Kütüphane Binalarının mekansal organizasyonlarında ergonominin önemi ve standardizasyon. *Türk Kütüphaneciliği*, 6:3, 160-171s.
- Riddell, S., Goldie, S., Hill, A., Eagles, D. & Drew, T.D. (2020). The effect of temperature on persistence of SARS-CoV-2 on common surfaces. *Virology*, 17(145), <https://doi.org/10.1186/s12985-020-01418-7>
- Rishi, P., Sinha, S.P. & Dubey, R. (2000). A correlational study of workplace characteristics and work satisfaction among Indian bank employees. *Psychologia*, 43(3), 155-164.
- Şener, H. (1979). Tasarlayıcıya verilecek mimari programların içerik sınırları ifade biçimleri ve Endüstrileşmiş Bina Açısından Değerlendirilmesi. Yapı Araştırmaları Enstitüsü Bina Programlama Semineri, Ankara; Tübitak.
- Tamdoğan, O. G. (2009). Bilgi üretiminde yazın ürünleri ve kütüphaneler: Atıfların tespiti ve analizi yoluyla araştırma. *Türk Kütüphaneciliği*, 23(2), 254-277.
- van Doremalen, N., Bushmaker, T., Morris, D.H., Holbrook, M.G., Gamble, A., Williamson, B.N., Tamin, A., Harcourt, J.L., Thornburg, N.J., Gerber, S.I., Lloyd-Smith, J.O., de Wit, E. & Munster, V.J. (2020). Aerosol and surface stability of SARS-CoV-2 as compared with SARS-CoV-1. *The New England Journal Of Medicine*, <https://doi.org/10.1056/NEJMc2004973>.
- Vischer, J. C. (2008). Towards an environmental psychology of workspace: how people are affected by environments for work. *Architectural Science Review*, Volume 51.2, 97-108.
- Yüksel, Ç. Y. (2018). Dış Gölge Elemanının Pencere Boyutlarıyla Bağlantılı Gölgeleme Veriminin Araştırılması. Ulusal Çatı & Cephe Konferansı, 43, İstanbul Kültür Üniversitesi-İstanbul.